

SECTION 06 20 00

FINISH CARPENTRY

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN FOREST FOUNDATION (AFF)

ATFS STANDARDS (2015) American Tree Farm System Standards
of Sustainability 2015-2020

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4 (1995; R 2004) Basic Hardboard

AHA A135.6 (1998; R 2006) Hardboard Siding

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC PS 20 (2015) American Softwood Lumber Standard

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B18.2.1 (2012; Errata 2013) Square and Hex Bolts
and Screws (Inch Series)

ASME B18.2.2 (2022) Nuts for General Applications:
Machine Screw Nuts, and Hex, Square, Hex
Flange, and Coupling Nuts (Inch Series)

ASME B18.6.1 (2016) Wood Screws (Inch Series)

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA M4 (2023) Standard for the Care of
Preservative-Treated Wood Products

AWPA U1 (2023) Use Category System: User
Specification for Treated Wood

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E445 (2002) Performance Standards and
Qualification Policy for Structural-Use
Panels (APA PRP-108)

APA L870 (2010) Voluntary Product Standard, PS
1-09, Structural Plywood

APA S350 (2014) PS 2-10, Performance Standard for
Wood-Based Structural-Use Panels

ASTM INTERNATIONAL (ASTM)

- ASTM D2898 (2010; R 2017) Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
- ASTM F547 (202) Standard Terminology of Nails for Use with Wood and Wood-Base Materials

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

- ANSI/BHMA A156.9 (2020) Cabinet Hardware

CALIFORNIA AIR RESOURCES BOARD (CARB)

- CARB 93120 (2007) Airborne Toxic Control Measure (ATCM) to Reduce Formaldehyde Emissions from Composite Wood Products

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH (CDPH)

- CDPH SECTION 01350 (2017; Version 1.2) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers

COMPOSITE PANEL ASSOCIATION (CPA)

- CPA A208.1 (2016) Particleboard

CSA GROUP (CSA)

- CSA Z809-08 (R2013) Sustainable Forest Management

FOREST STEWARDSHIP COUNCIL (FSC)

- FSC STD 01 001 (2015) Principles and Criteria for Forest Stewardship

GREEN SEAL (GS)

- GS-36 (2013) Adhesives for Commercial Use

HARDWOOD PLYWOOD AND VENEER ASSOCIATION (HPVA)

- HPVA HP-1 (2020) American National Standard for Hardwood and Decorative Plywood

INTERNATIONAL CODE COUNCIL (ICC)

- ICC IBC (2021) International Building Code

JAPANESE STANDARDS ASSOCIATION (JSA)

- JIS B 1135 (1995) Slotted Head Wood Screws
- JIS K 6902 (2022) Testing Method for

Laminated Thermosetting
High-Pressure Decorative Sheets

MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES (MAFF)

JAS F-7 (2019) Plywood

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA LD 3 (2005) Standard for High-Pressure
Decorative Laminates

NATIONAL HARDWOOD LUMBER ASSOCIATION (NHLA)

NHLA Rules (2015) Rules for the Measurement &
Inspection of Hardwood & Cypress

NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

NELMA Grading Rules (2013) Standard Grading Rules for
Northeastern Lumber

PROGRAMME FOR ENDORSEMENT OF FOREST CERTIFICATION (PEFC)

PEFC ST 2002:2013 (2015) PEFC International Standard Chain
of Custody of Forest Based Products
Requirements

REDWOOD INSPECTION SERVICE (RIS) OF THE CALIFORNIA REDWOOD
ASSOCIATION (CRA)

RIS Grade Use (1998) Redwood Lumber Grades and Uses

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule 1168 (2017) Adhesive and Sealant Applications

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003 (2014) Standard Grading Rules for Southern
Pine Lumber

SUSTAINABLE FOREST INITIATIVE (SFI)

SFI 2015-2019 (2015) Standards, Rules for Label Use,
Procedures and Guidance

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 770 Formaldehyde Standards for Composite Wood
Products

UNDERWRITERS LABORATORIES (UL)

UL 2818 (2022) GREENGUARD Certification Program
For Chemical Emissions For Building
Materials, Finishes And Furnishings

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)

WCLIB 17 (2015) Standard Grading Rules

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)

WWPA G-5 (2017) Western Lumber Grading Rules

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S.4 (2015A) Preservative Treatment for Millwork

WOOD MOULDING AND MILLWORK PRODUCERS ASSOCIATION (WMPMA)

WMPMA WM 6 (2007) Quality Industry Standards Booklet

WOODWORK INSTITUTE (WI)

NAAWS 3.1 (2017; 2018 Errata Edition) North American
Architectural Woodwork Standards

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings Indicating All Wood Assemblies; G[, [____]]

SD-03 Product Data

Wood Products; G[, [____]]

Countertops; G[, [____]]

Engineered Wood Products; G[, [____]]

Treated Wood Products; G[, [____]]

Soffits; G[, [____]]

Fascias and Trim; G[, [____]]

Hardware and Accessories; G[, [____]]

[VOC Content for Siding; S

][Recycled Content for MDF/Particleboard; S

] SD-04 Samples

Samples; G[, [____]]

SD-07 Certificates

Certificates of Grade; G[, [____]]

- [Certified Sustainably Harvested Wood for Trim and Frames; S
-][Certified Sustainably Harvested Softwood Plywood; S
-][Certified Sustainably Harvested Hardwood Plywood; S
-][Certified Sustainably Harvested Hardboard; S
-][Certified Sustainably Harvested Siding; S
-][Indoor Air Quality for Hardwood Plywood; S
-][Indoor Air Quality for MDF and Particleboard; S
-][Indoor Air Quality for Non-aerosol Adhesives; S
-][Indoor Air Quality for Aerosol Adhesives; S

1.3 DETAIL DRAWINGS

Submit detail drawings indicating all wood assemblies proposed for use in the project. Indicate materials, species, grade, density, grain, finish details of construction, location of use in the project, finishes, types, method and arrangement of fasteners, and installation details. This includes all fabricated assemblies.

1.4 PRODUCT DATA

Submit Manufacturers printed data including proposed species, grade, density grain, and finish as applicable; sufficient to demonstrate compliance with this specification for each type of wood product specified. For treated wood products also provide documentation of environmentally safe preservatives for each type of wood product specified.

Provide Manufacturers printed data for hardware and all wood accessories including but not limited to edge banding, adhesives, and sealers.

1.5 SAMPLES

Samples indicating proposed species, grade, density grain, and finish for each type of wood product specified. Provide samples of sufficient size to show pattern and color ranges of proposed products.

1.6 DELIVERY, STORAGE, AND HANDLING

Deliver wood products to the jobsite in an undamaged condition. Stack materials to ensure ventilation and drainage. Protect against dampness before and after delivery. Store materials under cover in a well ventilated enclosure and protect against extreme changes in temperature and humidity. Keep materials wrapped and separated from off-gassing materials (such as drying paints and adhesives). Do not use materials that have visible moisture or biological growth. Do not store products in building until wet trade materials are dry and humidity of the space is within wood manufacturer's tolerance limits for storage.

1.7 QUALITY ASSURANCE

1.7.1 Certifications

1.7.1.1 Certified Wood Grades

Provide certificates of grade from the grading agency on graded but unmarked lumber or plywood attesting that materials meet the grade requirements specified herein.

[1.7.1.2 Certified Sustainably Harvested Wood

Provide wood certified as sustainably harvested by FSC STD 01 001[, ATFS STANDARDS, CSA Z809-08, SFI 2015-2019, or other third party program certified by PEFC ST 2002:2013]. Provide a letter of Certification of Sustainably Harvested Wood signed by the wood supplier. Identify certifying organization and their third party program name and indicate compliance with chain-of-custody program requirements. Submit sustainable wood certification data; identify each certified product on a line item basis. Submit copies of invoices bearing certification numbers.

]1.7.1.3 Indoor Air Quality Certifications

1.7.1.3.1 Adhesives and Sealants

Provide products certified to meet indoor air quality requirements by UL 2818 (Greenguard) Gold, SCS Global Services Indoor Advantage Gold or provide certification or validation by other third-party programs that products meet the requirements of this Section. Provide current product certification documentation from certification body. When product does not have certification, provide validation that product meets the indoor air quality product requirements cited herein.

1.7.1.3.2 Composite Wood Products

For purposes of this specification, composite wood products include hardwood plywood, particleboard, medium density fiberboard (MDF), panel substrates, and door cores. Provide products certified to meet requirements of both 40 CFR 770 and CARB 93120. Provide current product certification documentation from certification body.

]1.7.2 Lumber

Identify each piece or each bundle of lumber, millwork, and trim by the grade mark of a recognized association or independent inspection agency certified by the Board of Review of the ALSC to grade the species.

1.7.3 Plywood

Provide each sheet of plywood with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. Marks must identify plywood by species group or span rating, exposure durability classification, grade, and compliance with APA L870 or JAS F-7.

1.7.4 Hardboard [and Particleboard]

Provide materials marks or written documentation identifying the producer and the applicable standard.

1.7.5 Pressure Treated Lumber and Plywood

Inspect each treated piece in accordance with AWPA U1.

1.7.6 Non-Pressure Treated Woodwork and Millwork

Mark, stamp, or label to indicate compliance with WDMA I.S.4.

1.7.7 Fire-Retardant Treated Lumber

Each piece must bear an Underwriters Laboratories fire resistance label or comparable label of another nationally recognized independent fire retardant materials testing laboratory.

PART 2 PRODUCTS

2.1 WOOD PRODUCTS

2.1.1 Sizes and Patterns of Wood Products

Provide yard and board lumber sizes in accordance with ALSC PS 20. Provide shaped lumber and millwork in the patterns indicated and in standard patterns of the association covering the species. Size references, unless otherwise specified, are nominal sizes. Provide actual sizes within manufacturing tolerances allowed by the applicable standard.

2.1.2 Species and Grades

Provide in accordance with AWPA U1 Use Category System Tables unless otherwise specified herein.

2.1.3 Trim, Finish, and Frames

Provide species and grades listed in the table below for wood materials that must be painted. For materials that must be stained, have a natural, or a transparent finish, provide materials one grade higher than those listed in the table below. Provide trim, except window stools and aprons with hollow backs.[Provide certified sustainably harvested wood for trim and frames.]

TABLE OF GRADES FOR WOOD TO RECEIVE PAINT FINISH		
Grading Rules	Species	Exterior and Interior Trim, Finish, and Frames
WWPA G-5 standard grading rules	Aspen, Douglas Fir-Larch, Douglas Fir South, Engelmann Spruce-Lodgepole Pine, Engelmann Spruce, Hem-Fir, Idaho White Pine, Lodgepole Pine, Mountain Hemlock, Mountain Hemlock-Hem-Fir, Ponderosa Pine-Sugar Pine, (Ponderosa Pine-Lodgepole Pine,) White Woods, (Western Woods,) Western Cedars, Western Hemlock	All Species: C & BTR. Select (Choice & BTR Idaho White Pine) or Superior Finish. Western Red Cedar may be graded C & BTR. Select or A & BTR in accordance with Special Western Red Cedar Rules.
WCLIB 17 standard grading rules	Douglas Fir-Larch, Hem-Fir, Mountain Hemlock, Sitka Spruce, Western Cedars, Western Hemlock	All Species: C & BTR VG, except A for Western Red Cedar
SPIB 1003 standard grading rules	Southern Pine	C & BTR
NHLA Rules	Cypress	C-Select
NELMA Grading Rules standard grading rules **	Balsam Fir, Eastern Hemlock-Tamarack, Eastern Spruce, Eastern White Pine, Northern Pine, Northern Pine, Northern White Cedar	All Species: C-Select except C & BTR for Eastern White Pine and Norway Pine
RIS Grade Use standard specifications	Redwood	Clear, Clear All Heart
NHLA Rules	Cypress	B Finish
	Red Gum, Soft Elm, Birch	Select or BTR (for interior use only)

Note: **

<http://www.nelma.org/library/2013-standard-grading-rules-for-northeastern-lumber/>

2.1.4 Utility Shelving

Provide utility shelving in a suitable species equal to or exceeding the requirements of No. 3 common white fir under WWPA G-5, 25 mm thick; or plywood, interior type, Grade A-B, 13 mm thick, any species group.

2.1.5 Softwood Plywood

Provide in accordance with APA L870 or JAS F-7.[Provide certified sustainably harvested softwood plywood.][When located on the interior of buildings, provide products with no added urea-formaldehyde resins.]

- a. Plywood for Soffits: Exterior type, B-B medium density overlay.
- b. Plywood for Shelving: Interior type, [A-B] [B-B] Grade, any species group.
- c. Plywood for Countertops: Exterior type, A-C Grade.

2.1.6 Hardwood Plywood

HPVA HP-1, Type [Technical (Exterior)] [I (Exterior)] [II (Interior)] [III (Interior)], [Premium (A)] [Good (1)] [Sound (2)] [Utility (3)] [Backing (4)] [Specialty (SP)] Grade, [hardwood veneer core construction,] [lumber core construction,] face veneers of [____], of thickness indicated.[Provide certified sustainably harvested hardwood plywood.][When located on the interior of buildings, provide products with no added urea-formaldehyde resins. For products located on the interior of the building (inside of the weatherproofing system), provide certification of indoor air quality for hardwood plywood.]

2.1.7 Hardboard

AHA A135.4, [standard] [tempered] [service] type, [3] [6] mm thick.[Provide certified sustainably harvested hardboard.]

[2.1.8 Medium Density Fiberboard (MDF) and Particleboard

CPA A208.1, Grade 1-M-2 or 2-M-2 or better.[For products located on the interior of the building (inside of the weatherproofing system), provide certification of indoor air quality for MDF and particleboard.]

Provide products with 80 percent total recovered materials content. Provide data identifying percentage of recycled content for MDF/particleboard.

]2.1.9 Stairs

Treads 32 mm thickness, clear red or white oak. Risers 19 mm nominal finish lumber.

2.1.10 Shoe Mould

Clear red or white oak, 13 by 16 mm unless otherwise indicated.

2.1.11 Wood Seats

Clear maple, oak, or other suitable hardwood, not less than 40 mm thick, with rounded edges. Provide stainless steel stanchions or brackets.

2.1.12 Wood Bumpers

Clear oak[, maple] [, birch] [or] [____], dressed to size indicated and with outer edges beveled.

2.1.13 Catwalks

Boards, 19 by 140 mm, species and grade equal to or exceeding 3 Common Hem-Fir under WWP A G-5.

2.1.14 Siding

Provide hardboard, plywood, or wood for horizontal siding. Provide hardboard or plywood for panel siding.[Provide certified sustainably harvested siding.][When located on the interior of buildings, provide products with no added urea-formaldehyde resins. Provide data identifying VOC content for siding.]

2.1.14.1 Horizontal Hardboard Siding

AHA A135.6, factory primed face and longitudinal edges, factory sealed back, lap type, [200] [225] [250] [300] mm wide, maximum practicable lengths, 9.5 or 11 mm thick, [smooth] [embossed] [textured] face.

2.1.14.2 Panel Hardboard Siding

AHA A135.6, factory primed face and longitudinal edges, factory sealed back, 1220 mm wide, maximum practicable lengths, 9.5 or 11 mm thick, [smooth] [embossed] face [, and grooved as selected from manufacturer's standard patterns].

2.1.14.3 Horizontal Plywood Siding

APA L870 or JAS F-7, exterior, [medium density overlay] lap type, [150] [200] [300] mm wide, maximum practicable lengths, [9.5] [11] [12] [13] mm thick, [smooth] [embossed] [rough sawn texture] [embossed] face.

2.1.14.4 Panel Plywood Siding

APA L870 or JAS F-7, exterior, [medium density overlay,] 1220 mm wide, maximum practicable lengths, span rating of [400] [600] mm on center, [smooth] [embossed] [rough sawn texture] [striated] face, [and grooved] as selected from manufacturer's standard patterns.

2.1.14.5 Horizontal Rated Siding

Qualified under APA E445, exterior type [medium density overlay], lap types, [150] [200] [250] [300] mm wide, maximum practicable lengths, [11] [12] [13] mm thick, [smooth] [embossed] [rough sawn texture] face.

2.1.14.6 Panel Rated Siding

Qualified under APA E445, exterior type, [medium density overlay] 1220 mm wide, maximum practicable lengths, [span rated at 400 mm] [span rated at 600 mm,] [smooth] [embossed] [striated] face [, and grooves] as selected from manufacturer's standard patterns.

2.1.14.7 Wood Siding

Provide [horizontal bevel type, minimum 5 mm thin edge by minimum 11 mm thick edge,] [horizontal plain lap type] [horizontal drop type] [vertical board, tongue and groove or shiplap on long edges,] [vertical board and batten type,] 25 mm thick, [150] [200] [250] mm wide, maximum practicable lengths, [smooth] [rough sawn texture].

2.1.14.8 Engineered Wood Structural Panels

Comply with ICC IBC, Chapter 23 Wood, and with APA S350, exterior, exposure [1] [2], [single-faced] [double-faced], 1200 mm wide, maximum practicable lengths, selected from manufacturer's standard patterns to satisfy the wind load for the specified span.

2.1.14.9 Epoxy Coated Wood Panels

Provide prefinished epoxy coated wood panels consisting of an asbestos-free cement board base sheet with a factory applied surface of epoxy resin and decorative natural stone chips. Provide factory applied finish in a minimum 0.5 mm thickness consisting of 100 percent solids, with a two component epoxy resin based coating followed by an application of inert aggregate. Provide stone color(s) and accessory colors as selected by Contracting Officer's Representative from manufacturer's full color and pattern ranges. Provide cement board base sheets in a minimum thickness of 6 mm thick. Dimensionally stable finished panels are required. Water absorption on the surfaced side of panels cannot exceed 0.20 percent after 24 hours of submergence in water. Provide accessories in manufacturer's standard extruded aluminum. Provide mouldings for meeting strips, end caps, inside corners, outside corners. Provide non-corrosive, self-tapping screw type fasteners finished to match the color of the panel surface. Provide caulking compounds that are color compatible, low modulus silicone or urethane types.

2.2 SOFFITS

2.2.1 Hardboard and Plywood

Provide hardboard and plywood soffits in siding grade hardboard, 10 or 11 mm thick; plywood, APA L870 or JAS F-7, exterior type, [Grade A-C] [plywood panel siding] [rated siding], [9 mm thick for 600 mm on center] [12 mm thick for 800 mm on center] [15 mm thick for 1200 mm on center] maximum span with all edges supported.

2.3 FASCIAS AND TRIM

2.3.1 Wood

Provide species and grades for all fascia and trim, including exterior door and window casings, in accordance with AWPA U1 Use Category System Tables. Provide sizes indicated. Metal corners may be provided in lieu of wood corner boards for horizontal siding. If metal corners are used, provide galvanized steel or aluminum, completely coated with primer compatible for the specific metal substrate.

2.4 COUNTERTOPS

2.4.1 Laminated Plastic-faced Countertops

ANSI/NEMA LD 3 or JIS K 6902.

2.4.1.1 Countertop Finishes

High pressure plastic laminate, Grade GP 50 or PF 42, satin or textured finish. Provide color and pattern [_____] [as selected by Contracting Officer's Representative from manufacturer's full color and pattern ranges].

2.4.1.2 Backing Sheet

Heavy gauge, BK 20.

2.4.2 Solid Surface

For solid surface countertops refer to Section 06 61 16, SOLID POLYMER (SOLID SURFACING) FABRICATIONS.

2.5 MOISTURE CONTENT OF WOOD PRODUCTS

Air dry or kiln dry lumber. Kiln dry treated lumber after treatment. Maximum moisture content of wood products at time of delivery to the jobsite, and when installed, must be as follows:

- a. Interior Paneling: [6] [12] percent.
- b. Interior Finish Lumber, Trim, and Millwork: 25 mm or Less in Thickness: [6] [12] percent on 85 percent of the pieces and [8] [15] percent on remainder.
- c. Exterior Treated and Untreated Finish Lumber and Trim: 89 mm or Less in Thickness: 19 percent.
- d. Exterior Wood Siding: 15 percent.
- e. Provide moisture content of other materials in accordance with the applicable standards.

2.6 PRESERVATIVE TREATMENT OF WOOD PRODUCTS

2.6.1 Non-Pressure Treatment

Treat woodwork and millwork, such as [cabinets,]exterior trim, door trim, and window trim, in accordance with WDMA I.S.4, with either 2 percent copper naphthenate, 3 percent zinc naphthenate, or 1.8 percent copper-8-quinolinolate. Provide a liberal brush coat of preservative treatment to field cuts and holes.

2.6.2 Pressure Treatment

Treat lumber and plywood used on the exterior of buildings [or in contact with masonry or concrete] with a waterborne preservative listed in AWPA U1 (P series is included therein by reference) as applicable, and inspected in accordance with AWPA U1. Identify treatment on each piece of material by the quality mark of an agency accredited by the Board of Review of the

American Lumber Standards Committee. Provide treated plywood to a reflection level as follows:

Preservative treat exterior wood moulding and millwork that will be within 455 mm of soil or in contact with water or concrete in accordance with WMPMA WM 6. Provide a field treatment in accordance with AWPA M4 of exposed areas of treated wood that have been cut or drilled. Items of all-heart material of cedar, cypress, or redwood do not require preservative treatment except when in direct contact with soil.

2.7 FIRE-RETARDANT TREATMENT

2.7.1 Wood Products

Pressure treat fire-retardant treated lumber and plywood in accordance with AWPA U1. Comply with material use as defined in AWPA U1 for Interior Type [A] [and] [B] and Exterior Type. Treatment and performance inspection must be conducted by a qualified independent testing agency that establishes performance ratings. Each piece or bundle of treated material must bear identification of the testing agency to indicate performance with such rating. Subject treated materials that will be exposed to rain wetting to an accelerated weathering technique in accordance with ASTM D2898, Method A, prior to being tested for compliance with AWPA U1.

Treat the following items:

[_____].

2.8 HARDWARE AND ACCESSORIES

Provide sizes, types, and spacings of hardware and accessories as recommended in writing by the wood product manufacturer, except as otherwise specified.

2.8.1 Wood Screws

ASME B18.6.1 or JIS B 1135.

2.8.2 Bolts, Nuts, Lag Screws, and Studs

ASME B18.2.1 and ASME B18.2.2.

2.8.3 Nails

Use nails of a size and type best suited for each application and in accordance with ASTM F547. Use hot-dipped galvanized or aluminum nails for exterior applications. For siding, provide nails of sufficient length to extend 40 mm into supports, including wood sheathing over framing. Where nailing is impractical, provide screws of a size and type best suited for each application.

2.8.4 Adjustable Shelf Standards

ANSI/BHMA A156.9, Type [_____], with shelf rests Type [_____].

2.8.5 Vertical Slotted Shelf Standards

ANSI/BHMA A156.9, Type [_____], with shelf brackets Type [_____].

2.8.6 Closet Hanger Rods

Chromium plated steel rods, not less than 25 mm diameter by 1.3 mm thick. Rods may be adjustable with integral mounting brackets if smaller tube is 25 mm by 1.3 mm thick. Provide intermediate support brackets for rods more than 1200 mm long.

2.9 FABRICATION

2.9.1 Quality Standards (QS)

2.9.1.1 Grades

The terms "Premium," "Custom," and "Economy" refer to the quality grades defined in NAAWS 3.1. Provide items not otherwise specified in a specific grade as "Custom" grade.

2.9.1.2 Adhesives

Select adhesives for durability and permanent bonding. Address factors such as materials that must be bonded, expansion and contraction, bond strength, fire rating, moisture resistance, and manufacturer's recommendations.

[Provide non-aerosol adhesive products used on the interior of the building (defined as inside of the weatherproofing system) meeting either emissions requirements of CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type) or VOC content requirements of SCAQMD Rule 1168. Provide aerosol adhesives used on the interior of the building meeting either emissions requirements of CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type) or VOC content requirements of GS-36. Provide certification or validation of indoor air quality for non-aerosol adhesives applied on the interior of the building (inside of the weatherproofing system). Provide certification or validation of indoor air quality for aerosol adhesives used on the interior of the building.

]2.9.2 Countertops

Fabricate with lumber and a core of [exterior plywood] [or] [particleboard], glued and screwed to form an integral unit. Bond laminated plastic under pressure to exposed surfaces, using adhesive as recommended by the plastic manufacturer [, and bond a backing sheet under pressure to underside of countertop]. Provide countertop units as post-formed type, no-drip nose, cove mouldings, Style A backsplash, and surfaced with ANSI/NEMA LD 3 or JIS K 6902, Grade PF 42 plastic. Provide backsplashes not less than 90 mm nor more than 115 mm high.

2.9.3 Cabinets

Unless specified otherwise, provide wall and base cabinets of the same construction, materials, and finishes as countertops. Fabricate cabinets with solid ends and frame fronts, or with frames all around. Provide frames of solid hardwood not less than 19 by 38 mm. Provide ends, bottoms, backs, partitions, and doors as hardwood plywood. Mortise and tenon, dovetail, or dowel and glue joints to produce a rigid unit. Cover exposed edges of plywood with hardwood strips. Provide cabinet doors, frames, and solid exposed ends 19 mm thick minimum. Provide cabinet

bottoms, partitions, and framed ends to be 13 mm minimum. Provide shelves to be 16 mm thick minimum. Provide cabinet backs 6 mm thick minimum.

2.9.3.1 Cabinet Hardware

ANSI/BHMA A156.9. Provide cabinet hardware including two self, closing hinges for each door, two side mounted metal drawer slides for each drawer, and pulls for all doors and drawers as follows. Provide hardware exposed to view [as bright chromium plated][_____]. Comply with the following requirements for all cabinet hardware:

- a. Provide frameless concealed European style, back mounted hinges with 165 degree opening and a self closing feature when at less than 90 degrees open.
- b. Provide drawer slides having a static rating capacity of [444 N][_____]. Slides to have a self closing/stay closed action, zinc or epoxy coated steel finish, ball bearing rollers, and positive stop with lift out design.
- c. Provide drawer pulls as [wire type pulls with center-to-center dimension of not less than 89 mm and a cross sectional diameter of 8 mm]. Provide handle projections not less than[33 mm]. [_____].
- d. Provide heavy duty magnetic drawer catches.

2.9.3.2 Finish

Provide a clear factory finish on wood surfaces after fabrication. Provide fabricator's standard natural finish equivalent to one coat of sealer, one coat of varnish on all surfaces and a second coat of varnish on surfaces exposed to view. Provide spar varnish in exterior or wet area applications. Sand lightly and wipe clean between coats.

2.9.4 Workbenches

Dovetail and glue drawer corners. Fasten frames with suitable wood screws or bolts. Sand exposed surfaces smooth, and ease exposed edges. Provide two side mounted, metal, ball bearing drawer slides [ANSI/BHMA A156.9, Type [_____,] for each drawer, and at least two surface mounted hinges[, Type [_____,] and a magnetic catch[, Type [_____,] for each door.

2.9.5 Casework with Transparent Finish (CTF)

2.9.5.1 AWI Quality Grade

[Premium] [Custom] [Economy] grade.

2.9.5.2 Construction

Provide [reveal overlay] [flush overlay] [exposed face frame] design details.

2.9.5.3 Exposed Parts

[_____] specie, [_____] cut.

2.9.5.4 Semi-Exposed Parts

As specified in the NAAWS 3.1 for the grade selected.

2.9.6 Casework with High Pressure Laminate Finish

2.9.6.1 AWI Quality Grade

[Premium] [Custom] grade.

2.9.6.2 Construction

Provide [reveal overlay] [flush overlay] [exposed face frame] design details.

2.9.6.3 Exposed Surfaces

High pressure plastic laminate, color and pattern [_____] [as selected by Contracting Officer's Representative from manufacturer's full range].

2.9.6.4 Semi-Exposed Surfaces

As specified in the NAAWS 3.1 for the grade selected.

[2.9.6.5 Edge Banding

Provide edge banding for casework doors and drawer fronts in PVC vinyl [0.5 mm] [3 mm] [_____] thick. Provide width [23.8 mm] [_____] [Match color and pattern to exposed door and drawer front laminate pattern and color.] [Provide color and pattern [_____] .]

]PART 3 EXECUTION

Do not install building construction materials that show visual evidence of biological growth.

3.1 FINISH WORK

Apply primer to finish work before installing. Where practicable, shop assemble and finish millwork items. Construct joints tight and in a manner to conceal shrinkage but to avoid cupping, twisting and warping after installation. Miter trim and mouldings at exterior angles; cope at interior angles and at returns. Provide millwork and trim in maximum practical lengths. Fasten finish work with finish nails. Provide blind nailing where practicable. Set face nails for putty stopping.

3.1.1 Exterior Finish Work

Machine sand exposed flat members and square edges. Machine finish semi-exposed surfaces. Construct joints to exclude water. In addition to nailing, glue joints with waterproof glue as necessary for weather resistant construction. Evenly distribute end joints in built-up members. Provide shoulder joints in flat work. Reinforce backs of wide-faced miters with metal rings and waterproof glue. Unless otherwise indicated, provide fascia and other flat members 19 mm thick minimum. Provide door and window trim in single lengths. Provide braced, blocked, and rigidly anchored cornices for support and protection of vertical joints. Provide soffits in largest practical size. Align joints of plywood over centerlines of supports. Fasten soffits with aluminum or

stainless steel nails. Back prime all concealed surfaces of exterior trim.

3.1.2 Interior Finish Work

After installation, sand exposed surfaces smooth. Provide window and door trim in single lengths.

3.1.3 Door Frames

Set plumb and square. Provide solid blocking at not more than 400 mm on center for each jamb. Position blocking to occur behind hinges and lock strikes. Double wedge frames and fasten with finish nails. Set nails for putty stopping.

3.1.4 Thresholds

Unless otherwise indicated, provide thresholds [16 mm thick by 70 mm wide with beveled sides] and cut to fit at jambs. Fasten thresholds with casing nails. Set nails for putty stopping.

3.1.5 Window Stools and Aprons

Provide stools with rabbets over window sills. Provide aprons with returns cut accurately to profile of member.

3.1.6 Bases

Provide flat member with a moulded top [and oak shoe mould]. Fasten base to framing or to grounds.[Nail shoe mould to base.] Set [shoe mould] [one-piece wood base] after finish flooring is in place.

3.1.7 Finish Stair Work

Fit, nail, screw, bolt, and glue stair work together to form a strong, rigid structure without squeaks or vibrations. Anchor newels and posts securely to stair framing. Cut newels, posts, and drops accurately around floor construction to make a tight fit. Embed balusters into treads and landings and secure with glue. Provide railings with straight runs that follow the slope of the stairs and have smooth curved turns. Return railing profile at ends and secure joints with bolts and nuts in accordance with structural load requirements for railings. Secure railing to posts and newels with concealed anchors. Support wall rails on metal brackets spaced near ends and at not more than 1500 mm on center.

3.2 SHELVING

Support 25 mm nominal thick wood shelf material or 19 or 20 mm thick plywood shelf material with end and intermediate supports arranged to prevent buckling and sagging.[Provide hook strips 25 mm by 100 mm nominal and cleats 25 mm by 50 mm nominal.] Provide cleats except where hook strips are specified or indicated.[Where adjustable shelving is indicated, provide standards and brackets or shelf rests for each shelf.][Anchor standards to wall at not more than 600 mm on center.]

3.2.1 Linen Closets

Unless indicated otherwise, provide linen closets with a counter shelf 500 mm wide located 900 mm above the floor, a lower shelf approximately 450 mm wide and 450 mm above the floor, and three upper shelves 285 mm wide

located 350 mm above the counter shelf and 350 mm apart.

3.2.2 Storage Rooms

Unless otherwise indicated, provide storage rooms with shelves 285 mm wide, bottom shelf 450 mm above the floor, top shelf 450 mm below the ceiling, and intermediate shelves approximately 450 mm apart.

3.2.3 Room Closets

Provide two shelves 285 mm wide. Support lower shelf by hook strips at back and ends, and provide full length wood or metal clothes hanger rods unless indicated otherwise.

3.2.4 Cleaning Gear Closets

Provide [shelves of size and arrangement indicated] [two shelves 350 mm wide].

3.3 CLOTHES HANGER RODS

Provide clothes hanger rods where indicated and in closets having hook strips. Set rods parallel with front edges of shelves and support by sockets at each end and intermediate brackets spaced not more than 1200 mm on center.

3.4 MISCELLANEOUS

3.4.1 Countertops

Conceal fastenings where practicable. Fit counters tight to adjoining surfaces and scribe where necessary. Provide scribed joints neat and flush. Provide counter sections in longest lengths practicable with a minimum number of joints. Where joints are necessary, provide tight joints drawn up with concealed type heavy pull-up bolts. Glue joints with water resistant glue and make rigid with screws, bolts, or other approved fastenings.

3.4.2 Cabinets

Provide cabinets level, plumb, true, and tight to adjacent walls. Secure cabinets to walls with concealed toggle bolts. Secure top to cabinet with concealed screws. [Make cutouts for fixtures from templates supplied by fixture manufacturer. Locate cutouts for pipes so that edges of holes are covered by escutcheons after installation.]

3.4.3 Workbenches

Provide level, plumb, and tight to adjacent construction. Fasten workbenches to walls with screws or toggle bolts and to floors with expansion bolts.

3.4.4 Wood Seats

Support seats [on brackets spiked to the studs] [on stanchions]. Secure seats to supports with [screws] [bolts] as required; countersink heads of [screws] [bolts] and fill holes with hardwood filler, finished flush with tops of seats.

3.4.5 Wood Bumpers

Bore, countersink, and bolt wood bumpers in place where indicated.

3.4.6 Catwalks in Attic Spaces

Lay boards with 25 mm spaces between. Stagger end joints, with each joint on a support.

3.5 SIDING

3.5.1 Installation of Siding

Fit and position siding without springing or otherwise forcing panels into place.[For siding to have a stain finish, set nails and stop with nonstaining putty to match finished siding.][For siding to have a paint finish, drive nails flush.]

3.5.2 Horizontal Siding

Locate end joints over framing members and alternate such that there are a minimum of two boards between joints on the same support. Evenly distribute shorter pieces throughout the installation. Provide starter strips to establish proper cant for siding. Predrill ends of siding as necessary to prevent splitting when nailed.[Horizontal bevel or plain lap siding: Overlap and nail into each support in accordance with recommendations of siding manufacturer.][Horizontal drop siding: Work each course into top edge of previous course. Nail into each support with [two nails, one near lower edge to clear top of previous course, and one just above mid-height of course.] [one nail just above mid-height of course.]]

3.5.3 Vertical Board Siding

Apply siding with horizontal joints only at locations indicated. Work each board into edge of previous course. Nail into supports at 600 mm on center with [two nails, one blind if possible at or near joint with previous board, and one just outside board centerline.] [one nail just outside board center line.]

3.5.4 Vertical Board and Batten Siding

Apply with horizontal joints only at locations indicated. Install each board with 13 mm of space between boards. Nail at center of board and into supports at 600 mm on center. Center battens over space between boards and nail down center at 400 mm on center.

3.5.5 Panel Siding

Apply panels with edges at joints spaced in accordance with manufacturer's recommendations. Provide shiplapped edges or square edges that will be covered by battens in a [primed for paint finish,] [sealed for stain finish]. Back all edges with framing members. Nail panels at edges 150 mm on center and at intermediate supports 300 mm on center. Locate edge nailing 10 mm from edges. For shiplap joints, nail 10 mm from visible joint and at a location to penetrate lap with previous panel. When panel siding is part of an engineered shear wall or used as wall bracing, nail shiplap joints to supports with double rows of nails. Space battens at [300] [400] mm on center and nail down center at 600 mm on center.

3.5.6 Epoxy Coated Panels

Provide panels where indicated and install in accordance with panel manufacturer's written installation instructions.

3.6 SOFFITS

3.6.1 Wood

Provide panels with edges at joints spaced in accordance with manufacturer's written instructions and with all edges backed by framing members. Nail panels 10 mm from edges at 150 mm on center and at intermediate supports at 300 mm on center. Provide panels in maximum practicable lengths.

3.7 FASCIA AND EXTERIOR TRIM

Construct, caulk, and machine sand exposed surfaces and edges to exclude water. In addition to nailing, glue joints as necessary for weather resistance. Evenly distribute end joints in built-up members. Shoulder joints in flat work. Reinforce backs of wide-faced miters with metal rings and glue. Provide fascia and other flat members in maximum practicable lengths. Braced, block, and rigidly anchor cornices for support and protection of vertical joints.

3.8 MOULDING AND INTERIOR TRIM

Install mouldings and interior trim straight, plumb, level and with closely fitted joints. Provide exposed surfaces machine sanded at the shop. Cope returns and interior angles at moulded items and miter external corners. Shoulder intersections of flatwork to ease any inherent changes in plane. Provide window and door trim in single lengths. Blind nail to the extent practicable. Set and stop face nailing with a nonstaining putty to match the applied finish. Use screws for attachment to metal; set and stop screws in accordance with the same quality requirements for nails.

-- End of Section --